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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/659,103

09/09/2003

Henry A. Hill

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MINNEAPOLIS, MN 55440-1022

EXAMINER

TURNER, SAMUEL A

ART UNIT

PAPER NUMBER

2877

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/11/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/659,103	Applicant(s) HILL, HENRY A.	
	Examiner Samuel A. Turner	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53, 55, 56, 58 and 62-64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-53, 55, 56, 58 and 62-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

Corrected drawings were received on 20 April 2007. These drawings are objected to by the examiner. Figure 3 is a typical double pass polarization interferometer based on a Michelson configuration, figure 6A is the manufacturing process for integrated circuits from design to shipment, and figure 6B is a detailed flowchart of the wafer process 1154 in figure 6A. See MPEP § 608.02. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

While figure 3 is a component of the invention, the interferometer is still prior art. While the invention is applied to the process steps in figures 6A and 6B, the inventive process is not shown. These same process flowcharts can be found in applicant's patents, as well as other prior art patents, since 2000.

Claim Rejections - 35 USC § 101

35 U.S.C. § 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The rejection of claims 1-43, 53, 55, and 62-64 under 35 U.S.C. § 101, contained in the action dated 23 August 2006 is repeated and incorporated herein.

MPEP 2106, Patent Subject Matter Eligibility, sets forth the criteria for evaluation of claimed subject matter with regard to a Judicial Exception under 35 U.S.C. § 101.

A claimed invention is directed to a practical application of a 35 U.S.C. 101 judicial exception when it:

- (A) “transforms” an article or physical object to a different state or thing; or
- (B) otherwise produces a useful, concrete and tangible result.

If USPTO personnel determine that the claim does not entail the transformation of an article, then USPTO personnel shall review the claim to determine it produces a useful, tangible, and concrete result. In making this determination, the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather on whether the final result achieved by the claimed invention is “useful, tangible, and concrete.”

a) "USEFUL RESULT"

For an invention to be “useful” it must satisfy the utility requirement of section 101. The USPTO’s official interpretation of the utility requirement provides that the utility of an invention has to be (i) specific, (ii) substantial and (iii) credible.

b) "TANGIBLE RESULT"

For a claim to meet the tangible result requirement it must recite more than a 35 U.S.C. 101 judicial exception, in that the process claim must set forth a practical application of that judicial exception to produce a real-world result.

c) "CONCRETE RESULT"

For a claim to meet the concrete result requirement the process must have a result that can be substantially repeatable or the process must substantially produce the same result again.

CLAIMS 1-16, 53, and 55:

Claim 1 is directed to a method for determining the location of an alignment mark and sets forth three positively claimed steps: measuring a location, x_1 ; measuring a location, x_2 ; and determining a location of the alignment mark.

Claim 1 fails to meet the criteria for a “physical transformation” under test (A) above because a determination of the alignment mark location does not produce a physical transformation.

Claim 1 meets the criteria for a “useful result” under test (B)(a) above in that the claim (i) is specific, determines the location of an alignment mark; (ii) is substantial, the “determination” is useful in the lithography field; and (iii) is credible, is within the known scope of a skilled artisans understanding of the art.

Claim 1 meets the criteria for a “concrete result” under test (B)(c) above in that the process is repeatable and will produce the same results.

Claim 1 fails to meet the criteria for a “tangible result” under test (B)(b) above. While the step of “determining a location of the alignment mark” does produce the alignment mark location, this result is not used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. Therefore, the result is abstract because the result has not been made available (saved, displayed, or used). Claims 2-16, 53, and 55 are included because they fail to further limit claim 1 to a tangible result.

CLAIMS 17-29, and 62-64:

Claim 17 is directed to a method and sets forth two positively claimed steps: determining a correction term related to imperfections in an interferometry system; and correcting subsequent measurements of a third degree of freedom of the measurement object.

Claim 17 fails to meet the criteria for a “physical transformation” under test (A) above because the correction of subsequent measurements of a third degree of freedom of the measurement object does not produce a physical transformation.

Claim 17 meets the criteria for a “useful result” under test (B)(a) above in that the claim (i) is specific, corrects subsequent measurements of a third degree of freedom of the measurement object; (ii) is substantial, the “correction” is useful in the lithography field; and (iii) is credible, is within the known scope of a skilled artisans understanding of the art.

Claim 17 meets the criteria for a “concrete result” under test (B)(c) above in that the process is repeatable and will produce the same results.

Claim 17 fails to meet the criteria for a “tangible result” under test (B)(b) above. While the step of “correcting subsequent measurements of a third degree of freedom of the measurement object” does produce a data correction, this result is not used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. Therefore, the result is abstract because the result has not been made available (saved, displayed,

or used). Claims 18-29, and 62-64 are included because they fail to further limit claim 17 to a tangible result.

CLAIMS 30-39:

Claim 30 is directed to a method that sets forth four positively claimed steps: scanning a mirror surface; monitoring locations X_1 and X_2 of the mirror surface; determining a profile of the mirror surface; and determining a correction term.

Claim 30 fails to meet the criteria for a “physical transformation” under test (A) above because a determination of a correction term does not produce a physical transformation.

Claim 30 meets the criteria for a “useful result” under test (B)(a) above in that the claim (i) is specific, determines a correction term; (ii) is substantial, the “determination” is useful in the lithography field; and (iii) is credible, is within the known scope of a skilled artisans understanding of the art.

Claim 30 meets the criteria for a “concrete result” under test (B)(c) above in that the process is repeatable and will produce the same results.

Claim 30 fails to meet the criteria for a “tangible result” under test (B)(b) above. While the step of “determining a correction term” does produce the correction term, this result is not used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. Therefore, the result is abstract because the result has not been

made available (saved, displayed, or used). Claims 31-39 are included because they fail to further limit claim 30 to a tangible result.

CLAIMS 40-43:

Claim 40 is directed to a method that sets forth a single positively claimed step: correcting measurements of a degree of freedom of a mirror relative to a first axis.

Claim 40 fails to meet the criteria for a “physical transformation” under test (A) above because correcting measurements of a degree of freedom of a mirror relative to a first axis does not produce a physical transformation.

Claim 40 meets the criteria for a “useful result” under test (B)(a) above in that the claim (i) is specific, correcting measurements of a degree of freedom of a mirror relative to a first axis; (ii) is substantial, the “correcting” is useful in the lithography field; and (iii) is credible, is within the known scope of a skilled artisans understanding of the art.

Claim 40 meets the criteria for a “concrete result” under test (B)(c) above in that the process is repeatable and will produce the same results.

Claim 40 fails to meet the criteria for a “tangible result” under test (B)(b) above.

While the step of “correcting measurements of a degree of freedom of a mirror relative to a first axis” does produce corrected measurement data, this result is not used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. Therefore, the

result is abstract because the result has not been made available (saved, displayed, or used). Claims 41-43 are included because they fail to further limit claim 40 to a tangible result.

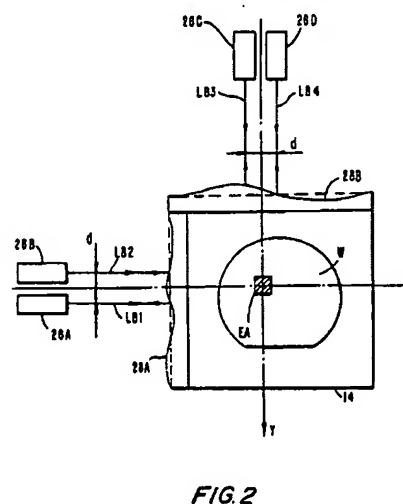
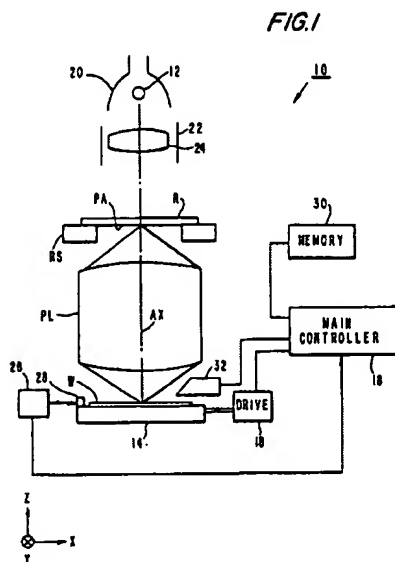
Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-29, 44-53, 55, 56, 58, and 62-64 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Kamiya(5,790,253).



CLAIMS 1-16, 53, 55, 56, and 58:

Claim 1 is a method for determining the location of an alignment mark on a stage that sets forth three positively claimed steps which are met by Kamiya:

measuring a location, x_1 , of a stage along a first measurement axis using an interferometer(column 8, lines 40-47);

measuring a location, x_2 , of the stage along a second measurement axis substantially parallel to the first measurement axis(column 8, lines 40-47); and

determining a location of the alignment mark along a third axis substantially parallel to the first measurement axis based on x_1 , x_2 , and a correction term, ψ_3 (column 10, lines 37-51);

wherein the interferometer comprises interferometer optics configured to direct a measurement beam to reflect from a mirror where the interferometer optics or the mirror are attached to the stage(Fig. 2).

The language of the phrase " ψ_3 is calculated from predetermined information comprising information characterizing imperfections in the interferometer" suggest the step of calculating ψ_3 but does not require steps to be performed and therefore does not limit the scope of the method claimed, see MPEP 2111.04.

As to claim 2/1, wherein x_1 and x_2 correspond to the location of the mirror at the first and second measurement axes, respectively(column 8, lines 40-47).

As to claim 3/1, wherein x_2 is measured using a second interferometer comprising interferometer optics(column 8, lines 40-47).

As to claim 9/8, wherein the first axis and the second axis are separated by a distance d_1 and the first axis and measurement axis are separated by a distance y_{d1} (Fig 2).

Claim 10/1, sets forth an additional step of interferometrically monitoring the location of the stage along a y-axis substantially orthogonal to the first measurement axis which is met by Kamiya(column 8, lines 40-47).

As to claim 11/1, wherein the measurement beam reflects from the mirror more than once(column 2, lines 42-48).

Claims 4-8, and 12-16 suggest additional contributions to the correction term ψ_3 but do not require steps to be performed. Therefor claims 4-8, and 12-16 do not limit the scope of the method claimed, see MPEP 2111.04.

Claim 53 is directed to a lithography method that sets forth five positively claimed steps which are met by Kamiya:

supporting the wafer on a moveable stage(column 5, lines 6-22);
imaging spatially patterned radiation onto the wafer(column 5, lines 6-22);
adjusting the position of the stage(column 5, lines 6-22); and
monitoring the position of the stage using an interferometry system(column 5, lines 6-22),

wherein monitoring the position of the stage comprises determining the location of an alignment mark on the stage using the method of claim 1(see claim 1 above).

Claim 55 is directed to a lithography method that sets forth three positively claimed steps which are met by Kamiya:

positioning a first component of a lithography system relative to a second component of a lithography system to expose the wafer to spatially patterned radiation(column 5, lines 6-22); and

monitoring the position of the first component relative to the second component using an interferometry system(column 5, lines 6-22),

wherein monitoring the position of the first component comprises determining the location of an alignment mark on the first component using the method of claim 1(see claim 1 above).

Claim 56 is directed to a method for fabricating integrated circuits that sets forth three positively claimed steps which are met by Kamiya:

applying a resist to a wafer(column 5, line 13);

forming a pattern of a mask in the resist by exposing the wafer to radiation using the lithography method of claim 53(see claim 53 above); and

producing an integrated circuit from the wafer(column 1, lines 51-59).

Claim 58 is directed to a method for fabricating integrated circuits that sets forth three positively claimed steps which are met by Kamiya:

applying a resist to a wafer(column 5, line 13);

forming a pattern of a mask in the resist by exposing the wafer to radiation using the lithography method of claim 55(see claim 55 above); and

producing an integrated circuit from the wafer(column 1, lines 51-59).

CLAIMS 17-29, and 62-64:

Claim 17 is a method that sets forth two positively claimed steps that are met by Kamiya:

determining a correction term related to imperfections in interferometer optics of a first interferometer in an interferometry system from measurements of first and second degrees of freedom of a measurement object with the interferometry system, where the interferometer optics are configured to direct a beam to reflect from the measurement object(column 8, lines 40-47); and

correcting subsequent measurements of a third degree of freedom of the measurement object made using the interferometry system based on the correction term(column 10, lines 37-51). Note that the imperfections in the interferometer optics are the measurement mirror curving errors and claim 17 does not differentiate between the optics and the mirror.

As to claim 18/17, wherein the first and second degrees of freedom comprise positions of the measurement object relative to first and second axes of the interferometry system, respectively(column 8, lines 40-47).

As to claim 19/18, wherein the first axis is substantially parallel to the second axis(column 8, lines 40-47).

As to claim 20/19, wherein the third degree of freedom comprises a position of the measurement object relative to a third axis substantially parallel to the first and second axes(column 10, lines 37-51).

As to claim 21/20, wherein the second axis is located between the first and third axes(see the x-axis between the interferometers 26A and 26B).

As to claim 22/17, wherein the measurement object comprises a plane mirror(column 7, lines 41-53).

As to claim 23/22, wherein the correction term further comprises information related to surface variations of the plane mirror(column 7, lines 41-53).

Claims 24-29 suggest additional contributions to the correction term but do not require steps to be performed. Therefor claims 24-29 do not limit the scope of the method claimed, see MPEP 2111.04.

Claim 62 is directed to a method for fabricating integrated circuits that sets forth five positively claimed steps which are met by Kamiya:

supporting the wafer on a moveable stage(column 5, lines 6-22);
imaging spatially patterned radiation onto the wafer(column 5, lines 6-22);
adjusting the position of the stage(column 5, lines 6-22); and
monitoring the position of the stage using an interferometry system(column 5, lines 6-22),

wherein monitoring the position of the stage comprises correcting a measurement of a of freedom of a measurement object associated with the stage using the method of claim degree 17(see claim 17 above).

Claim 63 is directed to a method for fabricating integrated circuits that sets forth three positively claimed steps which are met by Kamiya:

positioning a first component of a lithography system relative to a second component of a lithography system to expose the wafer to spatially patterned radiation(column 5, lines 6-22); and

monitoring the position of the first component relative to the second component using an interferometry system(column 5, lines 6-22),

wherein monitoring the position of the first component comprises correcting a measurement of a degree of freedom of a measurement object associated with the first component using the method of claim 17(see claim 17 above).

Claim 64 is directed to a method for fabricating a lithography mask that sets forth four positively claimed steps which are met by Kamiya:

directing a write beam to a substrate to pattern the substrate(column 5, lines 6-22);

positioning the substrate relative to the write beam(column 5, lines 6-22);
and

monitoring the position of the substrate relative to the write beam using an interferometry system(column 5, lines 6-22),

wherein monitoring the position of the substrate comprises correcting a measurement of a degree of freedom of a measurement object associated with the substrate using the method of claim 17 (see claim 17 above).

CLAIMS 44-52:

Claim 44 is directed to an apparatus having two positively claimed elements that are taught in Kamiya: an interferometer comprising interferometer optics(Fig. 2, 26A); and an electronic controller coupled to the interferometer(Fig. 2, 18).

The phrases “configured to monitor a location of a mirror surface along a first axis” and “configured to direct a beam to reflect from the mirror surface” do not limit the interferometer to a particular structure and therefor do not limit the scope of the claim. It has been held that the recitation that an element is “configured to” perform a function is not a positive limitation but only requires the ability to so perform and does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

The phrase “wherein during operation the electronic controller determines a location of the mirror surface along a third axis” is a functional limitation and can be met by the prior art if the structure of the prior art is capable of performing the claimed functions. The computer controller 18 is capable of performing any desired calculations. For functional language to limit an apparatus claim the limitation must be claimed using a “means-plus-function” format of 35 U.S.C. § 112, sixth paragraph.

2114 [R-1] Apparatus and Article Claims — Functional Language

**APPARATUS CLAIMS MUST BE STRUCTURALLY DISTINGUISHABLE FROM
THE PRIOR ART**

While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original).

Claim 45/44 includes an addition structural limitation of a second interferometer(Fig. 2, 26B).

Claim 46/45 further includes second interferometer optics(Fig. 2, 26B)

Claim 48/44 adds an additional structural requirement wherein the first axis is substantially parallel to the second measurement axis(Fig. 2).

Claim 49/48 adds an additional structural requirement wherein the third axis is substantially parallel to the first axes and the second axis is located between the first and third axes(Fig. 2).

The language found in claims 46 and 47 that is directed to the correction term is functional and can be met by the prior art if the structure of the prior art is capable of performing the claimed functions. The computer controller 18 is capable of performing any desired calculations. For functional language to limit an apparatus claim the limitation must be claimed using a "means-plus-function" format of 35 U.S.C. § 112, sixth paragraph.

Claim 50 is directed to a lithography system having three positively claimed structural limitations that are met by Kamiya:

a stage for supporting the wafer(Fig. 1, 14);

an illumination system for imaging spatially patterned radiation onto the wafer(Fig. 1, PL);

a positioning system for adjusting the position of the stage relative to the imaged radiation(Fig. 1, 16); and

the apparatus of claim 44(see claim 44 above) for monitoring the position of the wafer relative to the imaged radiation.

Claim 51 is directed to a lithography system having six positively claimed structural limitations that are met by Kamiya:

a stage for supporting the wafer(Fig. 1, 14); and

an illumination system(Fig. 1) including a radiation source(Fig. 1, 12), a mask(Fig. 1, R), a positioning system(Fig. 1, 16), a lens assembly(Fig. 1, PL), and the apparatus of claim 44(see claim 44 above).

The structural connections found in the wherein clause which are directed to the operation of the lithographic system are met by the elements of figures 1 and 2.

Claim 52 is directed to a beam writing system having five positively claimed structural limitations that are met by Kamiya:

a source providing a write beam to pattern a substrate(Fig. 1, 12);

a stage supporting the substrate(Fig. 1, 14);

a beam directing assembly for delivering the write beam to the substrate(Fig. 1, PL);

a positioning system for positioning the stage and beam directing assembly relative one another(Fig. 1, 16); and

the apparatus of claim 44(see claim 44 above) for monitoring the position of the stage relative to the beam directing assembly.

Double Patenting

The rejection of claims 1-53, 55, 56, 58, and 59 under the judicially created doctrine of obvious-type double patenting contained in the action dated 23 August 2006 is repeated and incorporated herein. Claims 62-64 are dependent from claim 17 and therefor are also included.

Response to Arguments

Applicant's arguments filed 26 January 2007 have been fully considered in response to the Office Action dated 23 August 2006.

35 U.S.C. § 101:

Applicant's arguments regarding the rejection of claims 1-43, 53, 55, and 62-64 under 35 U.S.C. § 101 are not persuasive. See the rejection under 35 U.S.C. § 101 above for claim analysis set forth in MPEP 2106.

Applicant's arguments with regard to claims 56 and 58 are persuasive because the claims now produce an integrated circuit. Therefor the rejection of claims 56 and 58 under 35 U.S.C. § 101 is withdrawn.

35 U.S.C. § 102(b):

A rejection of claims 1-29, 44-53, 55, 56, 58, and 62-64 under 35 U.S.C. § 102(b) is applied above.

The amendment of 20 April 2006 to claims 1, 3, and 4 only suggest the step of calculating the correction term based on the interferometer optics that direct light to the mirror. Claims 17 and 25 do include the positively claimed step of determining a correction term, but the amendment of 20 April 2006 does not exclude the mirror from the interferometer optics as found in claim 1.

In the apparatus of claim 44, the only structure claimed are the interferometer and the controller. The controller, during operation, determines the location of the mirror surface by application of a correction factor calculated from imperfections in the interferometer optics. The process steps performed by the controller do not differentiate from the prior art if identical structure exists that that is capable performing the claimed functions. See MPEP 2114 cited above.

35 U.S.C. § 103(a):

Applicant's arguments regarding the rejection of claims 1-4, 10-12, 17-23, 25-27, 30, 36, 38, 39, 44-53, 55, 56, 58, and 62-64 under 35 U.S.C. § 103(a) are not persuasive. While Kamiya does not provide details of the interferometers used, column 2, lines 43-54 do define the interferometers used in Kamiya as double-pass polarization interferometers.

However, Badami et al teach adjusting the polarizers 148 and 168 to compensate for first order cyclic error contributions, and averaging the phases of the detected signals to compensate for second order cyclic error contributions. Nowhere in Badami is a suggestion of compensating for cyclic errors by determining a correction term. Therefor, Badami et al teach away from post detection measurement correction for optical correction and phase quadrature subtraction using paired detectors.

Therefor the rejection of claims 1-4, 10-12, 17-23, 25-27, 30, 36, 38, 39, 44-53, 55, 56, 58, and 62-64 under 35 U.S.C. § 103(a) is withdrawn.

Allowable Subject Matter

Claims 30-43 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. § 101 and obvious-type double patenting, set forth in this Office Action.

Claim 30 positively claims the step determining a correction term and differentiates between the interferometer optics and the mirror. The prior art of record fails to teach these limitations in combination with the remaining limitations of claim 30. Claims 31-39 are dependent from claim 30 and therefor also include the allowable subject matter.

Claim 40 positively claims the step of correcting measurements of a degree of freedom of a mirror relative to a first axis based on information that accounts for imperfections in interferometer optics for different spatial frequencies and

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contributions to the correction from the different spatial frequencies are weighted differently. The prior art of record fails to teach this limitation. Claims 41-43 are dependent from claim 40 and therefor also include the allowable subject matter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Samuel A. Turner', with a stylized flourish at the end.

Samuel A. Turner
Primary Examiner
Art Unit 2877